Although it may be admitted that evidence of a more conclusive kind than any which has been offered by Dr. Schiavuzzi is required to establish the truth of his inference, yet there seems to be good reason for thinking that he has approached much nearer to a solution of the question than any of his predecessors. J. B. S.

NOTES.

AT the meeting of the Academy of Sciences, Paris, on the 17th inst., Admiral Mouchez spoke of the preparations which are being made for executing the photographic charts of the heavens. Ten of the photographic telescopes, seven by MM. Henry and Gautier, of Paris, and three by Sir H. Grubb, of Dublin, are expected to be finished by the end of 1888 and forwarded to various observatories in France, Spain, South America, and Australia. With the promised co-operation of England, the United States, and Russia, it is hoped that a good beginning will be made in 1889, and that the vast undertaking will be completed within the time anticipated by the International Congress of last April.

PROFS. CAYLEY, F.R.S., AND M. J. M. HILL retire from the Council of the London Mathematical Society. The new names selected by the Council for submission to the Society at its annual meeting (November 10), are those of Mr. A. Buchheim and Dr. J. Larmor. The De Morgan Medal, which we have already announced as awarded to Prof. Sylvester, F.R.S., will be presented to him at the aforesaid meeting.

ON December 8 next, Herr Friedrich Traugott Kützing will be eighty years of age, and a good many men of science in Germany are anxious to give emphatic expression on the occasion to their respect for his character and their appreciation of his labours. Herr Kützing was one of the first to recognize that the best material for the study of cells and their life is provided by the simplest plants; and the results of his researches are well known to all biologists. It is proposed that a gift of some kind shall be presented to him on his eightieth birthday, and an influential Committee has been appointed to make the necessary arrangements. If any English students of biology would like to associate themselves with their German colleagues in this matter, they should communicate with the secretary of the Committee, Herr Otto Müller, 44 Köthenerstrasse, Berlin, W.

M. NOLAN, student at the Geological Laboratory of the Sorbonne, has been intrusted by the French Ministry of Public Instruction with a mission to study the geology of the Balearic Islands.

A NOTIFICATION in the *Calcutta Gazette* states that the Maharanee of Cossimbazar has given twenty thousand rupees for the promotion of technical education in the Moorshedabad district. The donor of this munificent sum proposes that five thousand rupees shall be spent in purchasing the necessary apparatus and instruments. The interest on the remainder is to be devoted to endowing a class in the Berhampore Collegiate School, and establishing classes in connexion with the college class in some of the neighbouring elementary schools. The Lieutenant-Governor of Bengal accepts the gift, and approves of the scheme proposed by the Maharanee.

AN interesting address on English and foreign technical education was delivered last Saturday by Prof. Silvanus Thompson, at the Aldingham Institute, a school of technical education in Goldington Crescent, St. Pancras. In the course of his address Prof. Thompson drew attention to the fact that in Berlin there is a great State-aided institution in which every known industry is taught. This institution he described as a large building—as big as Buckingham Palace, if not quite so beautiful—standing on a site of about 12 acres. It had something like 500 rooms for technical teaching, and, in fact, was a perfect college, with a good library. He believed that the entire cost of that establishment had been about £960,000. It was a building which had cost about the same amount as one of our ironclads. The entire maintenance of the institution was about £38,000 per annum; but that expenditure and the original outlay were recouped by the well-to-do character of those who had passed through its teaching, and thus had become useful members of society instead of drags upon the country. For such a country as England a site not of 12 acres but of 40 acres would be required. It might cost £4,000,000 to build and £100,000 a year to maintain, and from the results which would follow it would be cheap at the price, for it would enable us to obtain every possible requirement of life from our own handicraftsmen, instead of having to go to foreign countries for what we need. It would do more, for the superiority of English workmanship would cause fresh demands to be made from us, not only throughout our own colonies, but from foreign countries also.

THE Geodynamical Committee of the Italian Meteorological Society held meetings at Aquila from September 6 to 8. A preliminary meeting had been held at Florence in May last to prepare the work of the present one. The object was to formulate practical and uniform directions for the seismological researches undertaken by the Society, and to deduce from our actual knowledge rules to be followed in the construction of houses, so as to diminish the risk of damage in earthquakes and undulatory motions. M. Bertelli, of Florence, explained the theory of his new bifilar instrument for determining the least tremors of the earth, and he was invited to prepare directions for its construction, erection, and use, to be added to the report of the discussion. He also described his apparatus for the protection of telephones from lightning. The choice of a type of seismograph was the subject of a long discussion, and a Committee was nominated for the study of this very important question. The consideration of the best mode of collecting, discussing, and publishing the seismic and micro-seismic observations now being made in Italy was referred to the same Committee. On the consideration of the rules to be followed in the construction of buildings, M. de Rossi, of Rome, indicated the further observations which ought to be made. MM. Denza, De Giorgi, Roberto, Bertelli, and Galli also took part in the discussion. The resolutions adopted will be printed, and distributed to the various municipalities for the instruction of the persons concerned. This meeting of students of seismology is the first that has been held in Italy. The Secretary of this enterprising Society is Dr. O. L. Bianco.

THE other day the Committee of the Chester Society of Natural Science passed a resolution, which was entered in their minutes, expressing their deep sense of the loss the Society had sustained through the death of Mr. John Price, which took place on Friday, the 14th inst. He had reached the ripe age of eighty-four. Upwards of forty years ago, when residing at Birkenhead, Mr. Price occupied himself with the fauna of the Birkenhead shore, and the value of his researches was recognized by various scientific investigators of acknowledged eminence. The last of his observations on the shore were embodied in a paper on the pluteus of the starfish, read before Section D of the British Association meeting at Liverpool in 1852. To the Proceedings of Section D of the British Association he contributed papers from time to time at subsequent meetings. Having settled at Chester in 1858, Mr. Price was soon the means of establishing in the city a Society for the study of natural history. Ten years later, after the appointment of the late Charles Kingsley to a canonry in the Chester Cathedral, this Association was merged in the present Society, founded by Mr. Kingsley, who was one of Mr. Price's intimate friends. Mr. Price accepted, and retained until his death, the position of Chairman of the Botanical Section of the Society. The resolution to which we have referred concludes as follows: "We shall miss from our meetings and excursions his venerable form, his familiar voice, and his wise counsels, but the name of 'Old Price' is one which will ever live in the Society as that of one of our revered fathers, and one of Nature's truest disciples and humblest and most loyal children."

THE last number of the Journal of the Royal Asiatic Society (N.S. vol. xix.) contains a short paper by Prof. de Lacouperie on the Miryeks, or stone men of Corea. These are huge half-length human figures, carved in stone, and looked upon as relics of a religion of former times. Those described by Mr. Carles in his paper on Corea, read before the Royal Geographical Society last year, are about 25 feet high, cut out of some large boulders in the middle of a fir wood in a hill-side. The largest hitherto known is at Unjin, and is shown in a plate prefixed to the paper. It stands about 62 feet high; and the body and head resemble those of the idols in Buddhist temples. A column about 10 feet high runs up from the head, giving support to an oblong slab about the same length; on this stands a smaller column supporting another slab, and from the corners of the two bells are pendent by chains. Prof. de Lacouperie points out some peculiarities about the word Miryek, and suggests that perhaps it is not Corean at all; it may have existed in Corea in its special adaptation to the huge stone statues, without having preserved its original meaning previous to the adoption of Chinese characters. If this be correct, it implies that the religion which produced the erection of the statues was then forgotten or in the shade. They might, he suggests, be due to an early spread of Buddhism in Corea. But it is evident that we must know more of that country before the origin of these curious survivals is clearly explained.

ANOTHER contribution to our knowledge of the group of beautiful dye colouring matters known as safranines has just been published in the current number of the *Comptes rendus* by MM. Barbier and Vignon. It has been known for some time that the nitroso-derivatives of the tertiary aromatic monamines in acting upon the primary monamines give rise to colouring matters, but their nature has hitherto remained undetermined. MM. Barbier and Vignon, however, in the light of their previous work, set out to explore this interesting side group of substituted safranines, with the following successful result. Starting with para-nitroso-dimethyl aniline, $C_6H_4NON(CH_3)_2$, they studied the action of one equivalent of its hydrochloride upon one equivalent of aniline in alcoholic solution, and found that a reaction occurred sufficiently violent to boil the alcohol. Eventually the product dissolved, forming a solution at first yellow, afterwards gradually changing to brown, and finally to bright violet-red, which on cooling deposited a solid. After filtration, washing, and repeated recrystallization this solid was obtained pure in brilliant brown crystalline spangles. Analysis showed that its composition was $C_{16}H_{20}N_4$, and from its reactions there can be little doubt that it is tetra-methyl diamido-azo-benzene. It is not very soluble in water, but, as is characteristic of all the safranines, is soluble in concentrated acids, forming deep-red or violet solutions. This, however, is not the only substance formed during the above reaction, for sodium chloride precipitated from the violet mother-liquor a second crystalline colouring matter, which turned out to be identical with the well-known dimethyl phenylene safranine, $C_{20}H_{18}N_4$. The formation of this latter body helps to explain the course of the reaction, which probably runs as follows: $3[C_6H_4NON(CH_3)_2HCl] + 2C_6H_5NH_2 = C_{16}H_{20}N_4 + C_{20}H_{18}N_4HCl + 3H_2O + 2HCl$. The work of MM. Barbier and Vignon, and of all other workers in this direction, is the more interesting inasmuch as it combines industrial utility with the advancement of pure chemistry, on the one side handing over new materials to the manufacturer, and on the other new facts to the already immense number which stand to the credit of the last few years.

THE *Times* reprints, from a document issued by the Berlin Bureau of Statistics, some interesting information about what is called "the motive force of the world." It appears that four-fifths of the engines now working in the world have been constructed during the last twenty-five years. France owns 49,590 stationary or locomotive boilers, 7000 locomotives, and 1850 boats' boilers; Germany has 59,000 boilers, 10,000 locomotives, and 1700 ships' boilers; Austria 12,000 boilers, and 2800 locomotives. The force equivalent to the working steam-engines represents—in the United States, 7,500,000 horse-power; in England, 7,000,000; in Germany, 4,500,000; in France, 3,000,000; and in Austria, 1,500,000. In these figures the motive power of the locomotives is not included, whose number in all the world amounts to 105,000, representing a total of 3,000,000 horse-power. Adding this amount to the other powers we obtain the total of 46,000,000 horse-power. A steam horse-power is equal to three actual horses' power; and a living horse is equal to seven men. The steam-engines of the world represent, therefore, approximately the work of 1,000,000,000 men, or more than double the working population of the earth, whose total population is supposed to amount to about 1,455,923,000 inhabitants. Steam has accordingly trebled man's working power.

IN the report presented at the eighteenth meeting of the Sunday Lecture Society it is stated that the attendance at the lectures during the last session was less than in the previous year. The Committee also announce that the accounts show an increased balance against the Society. On the other hand, they note with pleasure that good progress is being made by kindred associations in various parts of the country.

A SERIES of elaborate "geological studies," relating to the Dutch West Indies, by Prof. K. Martin, of the University of Leyden, is being issued by E. J. Brill, of Leyden. These "studies" embody the results of researches which Prof. Martin himself has carried on. In the first instalment, which has just been issued, he deals with the geology of Curaçao, Aruba, and Bonaire. This instalment consists of 140 handsome, well-printed pages, and is illustrated by three coloured geological maps, two plates, and thirty-six woodcuts.

A VALUABLE "Statistical Atlas of India," prepared for the Colonial and Indian Exhibition, 1886, and printed at Calcutta, may now be obtained at Mr. Edward Stanford's, Charing Cross. The object of the work is to give a general idea of the character of the country, its inhabitants and agriculture, with the addition of such statistics as may serve to illustrate commercial and educational progress. The maps have been prepared and printed in the office of the Surveyor-General of India at Calcutta, under the special supervision of Colonel Waterhouse and Major Strahan; and the chapters are by writers specially conversant with the subjects with which they deal.

MESSRS. CASSELL AND CO. have ready a new and enlarged edition of "Colour," a scientific and technical manual treating of the optical principles, artistic laws, and technical details governing the use of colours in various arts, by Prof. A. H. Church; and cheap editions of "The Fresh-water Fishes of Europe," by Prof. H. G. Seeley, F.R.S., and "Short Studies from Nature," a series of familiar papers, by eminent authors, on interesting natural phenomena, with full-page illustrations and diagrams.

NEW catalogues of scientific books have just been issued by Messrs. Macmillan and Bowes, Cambridge, Messrs. Dulau and Co., London, and Mr. W. P. Collins, London.

THE Cambridge Scientific Instrument Company have published a descriptive list of "anthropometric apparatus," consisting of instruments for measuring and testing the chief physical characteristics of the human body. This list cancels those previously issued. The instruments have been designed under the direction of Mr. Francis Galton.

A BIOLOGICAL and Microscopical Section has been formed in connection with the Cardiff Naturalists' Society, with Dr. C. T. Vachell, M.D., as President, and Prof. W. N. Parker as Hon. Sec. The inaugural meeting was held on Thursday evening, October 20, in the Biological Department of the University College, when papers were read on the work of the Section by the President and Hon. Sec. The objects of the Section are stated to be the promotion of the study of biology generally, but more especially of the local flora and fauna, including marine as well as land forms.

IT is announced that the following lectures will be delivered at the Royal Victoria Hall, Waterloo Bridge Road. November 1, Mr. A. H. Gilkes, "The First Napoleon;" 8th, Mr. W. L. Carpenter, "Heat" (experiments by means of the projection lantern); 15th, Dr. H. W. Crosskey, "Early Changes in the Earth's Surface and how we get our Knowledge of them;" 22nd, Sir John Lubbock, M.P., "The Habits and Ideas of Savages;" 29th, Mr. W. F. Donkin, "Mountain Climbing in Switzerland and the Caucasus;" December 6, Prof. Boyd Dawkins, F.R.S., "A Bit of Coal;" 13th, Dr. W. D. Halliburton, "The Eye, and how we See."

THE additions to the Zoological Society's Gardens during the past week include two Nisnas Monkeys (*Cercopithecus pyrrhonotus*) from West Africa, presented by Mrs. Benett Stanford; a Brown Capuchin (*Cebus fatuellus*) from Guiana, presented by Mr. Edward A. B. Pitman; a Dusky Ichneumon (*Herpestes pulverulentus*) from South Africa, presented by Mr. L. G. Morrell; a Three-striped Paradoxure (*Paradoxurus trivirgatus*) from India, presented by Mr. J. Millar; a Buzzard (*Buteo vulgaris*), British, presented by Mr. F. Austen; a Pennant's Broadtail (*Platycercus pennanti*) from New South Wales, presented by Mrs. Brooks; a Common Chameleon (*Chamæleon vulgaris*) from North Africa, presented by Mr. Absell; two Burrowing Owls (*Speotyto cunicularia*) from South America, presented by Mr. John Clarke Hawkshawe, F.Z.S.

OUR ASTRONOMICAL COLUMN.

THE PARALLAX OF Σ 2398.—In the *Astronomische Nachrichten*, No. 2676, Dr. E. Lamp, of Kiel, has published a determination of the parallax of the brighter component of this pair (to which his attention was attracted by their large proper motion) referred to two neighbouring stars derived from a series of differences of declination observed with the refractor and filar micrometer of the Kiel Observatory between February 1883 and April 1885; the value of the parallax deduced from this discussion being 0″·34. Wishing to verify this result, Dr. Lamp has made with the same instrument, between May 1885 and March 1887, a further series of measures of differences of declination of each component of Σ 2398 (= D.M. + 59°, No. 1915, mags. 8·2 and 9·0 respectively) referred to three comparison-stars: viz. D.M. + 59°, No. 1911, mag. 7·0; D.M. + 59°, No. 1913, mag. 9·4; and D.M. + 59°, No. 1918, mag. 7·8; and has published the results of his discussion of these measures in Nos. 2807–8 of the above-mentioned periodical. The following tabular statement gives for each series of observations the resulting parallax deduced from the differences of declination between each component of the double star and each of the above-mentioned comparison-stars:—

Period.	Component.	π_1	π_2	π_3	No. of Measures.
		″	″		
1883–84 ...	Σ_1 ...	— ...	+0·2958 ...	+0·3801	46
1884–85 ...	Σ_1 ...	— ...	+0·2517 ...	+0·4628	44
1885–87 ...	Σ_1 ...	+0·3601 ...	+0·2656 ...	+0·4303	73
1885–87 ...	Σ_2 ...	+0·3808 ...	+0·2636 ...	+0·4199	73

It would appear from this that Comparison-star No. 2 has a sensible parallax relative to Comparison-stars Nos. 1 and 3, and we hope that Dr. Lamp will proceed to investigate it independently. Meanwhile, combining the results obtained from the three stars, the mean parallax is—

$$\text{for } \Sigma_1 = 0''{\cdot}3520 \pm 0''{\cdot}0140$$
$$\text{and for } \Sigma_2 = 0{\cdot}3548 \pm 0{\cdot}0131,$$

or the mean parallax of the system Σ 2398 = 0″·353 ± 0″·014.

NEW MINOR PLANET.—A new minor planet, No. 271, was discovered on October 13 by Dr. Knorre, of Berlin.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1887 *OCTOBER* 30—*NOVEMBER* 5.

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on October 30

Sun rises, 6h. 52m.; souths, 11h. 43m. 46·2s.; sets, 16h. 36m.: right asc. on meridian, 14h. 17·7m.; decl. 13° 47′ S. Sidereal Time at Sunset, 19h. 11m.

Moon (Full on October 31, 22h.) rises, 16h. 38m.; souths, 23h. 12m.; sets, 5h. 58m.*: right asc. on meridian, 1h. 47·3m.; decl. 6° 0′ N.

Planet.	Rises.	Souths.	Sets.	Right asc. and declination on meridian.	
	h. m.	h. m.	h. m.	h. m.	° ′
Mercury .	9 21 ...	13 16 ...	17 11 ...	15 49·9 ...	23 5 S.
Venus ...	3 2 ...	9 8 ...	15 14 ...	11 41·4 ...	0 23 N.
Mars ...	1 21 ...	8 13 ...	15 5 ...	10 46·2 ...	9 29 N.
Jupiter ...	7 31 ...	12 14 ...	16 57 ...	14 48·3 ...	15 17 S.
Saturn ...	22 15*...	6 2 ...	13 49 ...	8 34·7 ...	19 2 N.
Uranus...	4 42 ...	10 20 ...	15 58 ...	12 53·9 ...	5 5 S.
Neptune.	17 36*...	1 18 ...	9 0 ...	3 49·8 ...	18 18 N.

* Indicates that the rising is that of the preceding evening and the setting that of the following morning.

Occultations of Stars by the Moon (visible at Greenwich).

Oct.	Star.	Mag.	Disap.	Reap.	Corresponding angles from vertex to right for inverted image.	
			h. m.	h. m.	°	°
30 ...	33 Ceti ...	... 6 ...	0 58 ...	1 44 ...	193	275
30 ...	35 Ceti ...	... 6½ ...	1 54 ...	3 3 ...	149	325
Nov.						
1 ...	μ Ceti ...	... 4 ...	2 34 ...	3 38 ...	109	355
3 ...	B.A.C. 1351	... 6½ ...	4 19 ...	4 30 ...	217	235
3 ...	75 Tauri ...	... 6 ...	6 41 ...	7 21 ...	89	5

Variable Stars.

Star.	R.A.	Decl.			
	h. m.	° ′		h. m.	
U Cephei	0 52·3 ...	81 16 N. ..	Nov. 2,	3 10	*m*
o Ceti	2 13·6 ...	3 29 S. ...	,, 5,		*M*
T Arietis	2 42·0 ...	17 2 N. ...	,, 4,		*m*
η Geminorum ...	6 8·1 ...	22 32 N. ...	Oct. 30,		*M*
ζ Geminorum ...	6 57·4 ...	20 44 N. ...	,, 30,	4 0	*m*
			Nov. 3,	4 0	*M*
U Hydræ	10 32·0 ...	12 48 S. ...	,, 3,		*m*
S Coronæ	15 16·8 ...	31 47 N. ...	,, 3,		*m*
V Ophiuchi	16 20·5 ...	12 10 S. ...	Oct. 31,		*M*
W Herculis	16 31·2 ...	37 34 N. ...	Nov. 4,		*m*
U Ophiuchi	17 10·8 ...	1 20 N. ...	,, 2,	2 23	*m*
		and at intervals of		20 8	
β Lyræ...	18 45·9 ...	33 14 N. ...	Nov. 2,	22 0	m_2
η Aquilæ	19 46·7 ...	0 43 N. ...	,, 1,	0 0	*m*
W Cygni	21 31·8 ...	44 52 N. ...	,, 1,		*m*
δ Cephei	22 25·0 ...	57 50 N. ...	,, 3,	3 0	*m*

M signifies maximum; *m* minimum; m_2 secondary minimum.

GEOGRAPHICAL NOTES.

LIEUT. WISSMANN, the well-known African explorer, has arrived at Brussels from his journey across Africa. He was accompanied as far as Nyangwé by Lieut. Le Marinel, the route followed being different from that traversed by Wissmann on his first journey. He did not, however, succeed in penetrating the region to the north of the Sankuru, nor in reaching the somewhat mysterious Lake Lundi.